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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/040,359	01/09/2002	Anthony A. Primavera	UIC 201	2850

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10/02/2002

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EXAMINER

PATEL, ISHWARBHAI B

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 10/02/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/040,359

Applicant(s)

PRIMAVERA, ANTHONY A.

Examiner

Ishwar (I. B.) Patel

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to because figures are improperly cross hatched.

All of the parts shown in section, and only those parts, must be cross hatched.

The cross hatching pattern should be selected from those shown on page 600-81 of the MPEP based on the material of the part. See also 37 CFR 1.84(h)(3) and MPEP 608.02.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. Figures 1, 2, 3, 4 and 5 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

“ the conductive material arranged in a shape” is vague and does not distinctly claim any specific structural shape.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

6. Claims 1-9, 10, 12, 14-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsukada et al., US Patent 6,228,466, hereafter Tsukada.

Regarding claim 1, 10 and 12, Tsukada discloses a contact pad for a circuit board, the contact pad comprising:

a central portion (central portion a, see figure 2, column 9, line 15-40); and

a plurality of spokes extending from the central portion, tabs - see figure 2.

Regarding claim 14, Tsukada discloses all the features of the claimed invention including the electrically conductive trace interconnecting the contact pad, see figure 2.

Regarding claims 2 and 15, Tsukada further discloses the central portion substantially circular, see figure 2.

Regarding claims 3 and 16, Tsukada further discloses each of the plurality of spokes substantially rectangular in shape, see figure 2.

Regarding claims 4 and 17, Tsukada further discloses one of the spokes is electrically connected to a metallic trace on the circuit board, see figure 2.

Regarding claims 5 and 18, Tsukada further discloses the circuit board is printed circuit board.

Regarding claims 6 and 19, Tsukada further discloses four spokes extending radially outwardly from the substantially circular portion, see figure 2.

Regarding claims 7 and 20, Tsukada further discloses the spokes substantially evenly spaced around the substantially circular portion, see figure 2.

Regarding claim 8, Tsukada further discloses a solder mask at outer tips of the spokes, see figure 2.

Regarding claim 9, Tsukada further discloses the contact pad made of conductive material, conductor circuit 12; see figure 2, column 9, line 15-40.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 11 and 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukada et al., US Patent 6,228,466, hereafter Tsukada as applied to claims 1-10 above, and further in view of Rostoker, US Patent 5,767,580.

Regarding claims 11 and 13, the applicant is claiming opening in a center of the pad. Though Tsukada does not disclose such opening in the central portion, such opening is known in the art for providing guide to and aligning the solder bump during

connection. Rostoker disclose one such pad with opening in the center, see Rostoker figure 4a. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the circuit board of Tsukada with opening in the center of the pad as taught by Rostoker in order to help align the bumps during assembly.

9. Claims 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukada et al., US Patent 6,228,466, hereafter Tsukada, as applied to claims 1-11 above and Suski et al., US Patent 5,414,223, hereafter Suski.

Regarding claims 21 to 25, the applicant is claiming the conductive pad with the conductive material arranged in such a shape that the perimeter is at least 5% longer than a circumference of a circle having a diameter that is equal to a diameter to distance between tow points on the perimeter of the contact pad that are farthest away from each other in claim 21 and that is 10%, 15%, 20% and 30% longer respectively in claims 22, 23, 24 and 25. Though Tsukada does not explicitly disclose such relationship, the crux of the invention of Tsukada is to increase the adhesion strength between the conductor circuit and the insulating substrate and ensures a high reliability of connection between the printed wiring board and a mounted part and such adhesion strength can be increased by providing tabs for additional contact area. The increase in the area will depend upon the type of component assembly and the force experienced during assembly and during the actual life cycle based on the thermal cycle and can be

adjusted with specific requirement. Further, Suski disclose a pad with increased area for reliable electrical connection. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the circuit board of Tsukada with the pad shape with increased area, as taught by Suski, as claimed in claims 21-25 in order to have increased area to increase adhesion strength to have be better and reliable connection of conductor and substrate and also between the substrate and the component.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fukasawa, Natrajan et al., Schueller, Brunner et al., Rinne et al., Takagami, Wojnarowski et al., disclose pad shape similar to applicant's claim invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (703) 305 2617. The examiner can normally be reached on M-F (6:30 - 4) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L Talbott can be reached on (703) 305 9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305 3431 for regular communications and (703) 305 7724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

ibp
September 25, 2002

Albert W. Paladini 9-27-02
ALBERT W. PALADINI
PRIMARY EXAMINER